THE INFLUENCE OF SOME MINERAL FERTILIZERS ON THE ACTIVITY OF THE CYANOBACTERIA *NOSTOC LINCKIA* AND *NOSTOC PUNCTIFORME*

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Dudnicenco Tatiana

Moldova State University, Department of Biology and Ecology
e-mail: dudnicenco@yahoo.com

Cyanobacteria are numbered among the organisms that have a clear role in soil fertility. The aim of this research was to assess the influence of mineral fertilizers, frequently used for the soils in the Republic of Moldova, on the activity of the cyanobacteria species *Nostoc linckia* (Roth.) Born. and Flah. and *Nostoc punctiforme* (Kützing) Hariot. The objectives of the investigations were: to study the morphological and physiological-biochemical particularities of these strains of *Nostoc*; to identify the factors that regulate their nitrogen-fixing activity, increasing their productivity, enriching soil with organic substances and nitrogen; to study the possibility of using these species as biological indicators; to determine the rates of the fertilizers that can be used without endangering the activity of these soil cyanobacteria.

The mentioned species, due to their biochemical composition, morphological and physiological particularities are potentially efficient biological indicators for the agriculture, and they also can enrich soil with fixed atmospheric nitrogen, and can be used for various purposes of the modern biotechnology.

0.2g/l of KCl in the nutrient medium was found to be optimal for the growth of both studied *Nostoc* species. 0.5g/l of $Ca(H_2PO_4)_2$ in the nutrient medium was optimal for the growth of both species. 1.1 g/l of the nitrofosca – a complex mineral fertilizer containing N, P, K – was optimal for the growth of the cyanobacterium *Nostoc linckia*, and 1.3 g/l was optimal for the growth of the cyanobacterium *Nostoc punctiforme*. The tested cyanobacteria were resistant to high concentrations of the nitrogen mineral fertilizers up to 2.4g/l of NH_4NO_3, 3.5g/l of $NaNO_3$, and 3.5g/l $Ca(NO_3)_2$, at these and higher concentrations the cyanobacteria slowed down their growth and even died. A relatively higher sensitivity was observed in the cases of P and K fertilizers.

Thus, the absence or small number of the *Nostoc* species in the soils they usually populate, may indicate an overuse of mineral fertilizers (in such cases this may be used for biological assessment of soil quality). On the other hand, insufficient fertilization or insufficient presence in soil of the biogenic elements such as N, P and K can also cause, as in the case of their surplus, decreases in the number of cyanobacteria or their absence.

In conclusion, the studied species, being sensitive to variations in the concentration of N (high concentrations), P and K salts can be used as biological indicators for assessing soil fertility and determining need for soil fertilization. To stimulate the activity of the nitrogen-fixing soil cyanophytes, it is necessary to control the salt concentrations in soil. At the unfavorably high concentrations of the fertilizer in the environment the tested cyanobacteria increased the cell size and became more rounded, thus reducing their contact surface (which is their adaptation mechanisms under unfavorable conditions). The ability to survive at minimum nitrogen concentrations was probably due to the fact that these organisms are nitrogen-fixing, and could provide themselves with this nutrient. At the same time the low concentrations of the nitrogen salts played a nutritional supplement role. Increased concentrations of nitrogen salts were toxic for the cyanobacteria, inhibiting their growth and even causing their death.